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L1: Entry 1 of 4

File: EPAB

May 5, 1998

PUB-NO: US005748603A  
DOCUMENT-IDENTIFIER: US 5748603 A  
TITLE: Optical pickup apparatus for different discs

PUBN-DATE: May 5, 1998

## INVENTOR-INFORMATION:

NAME

KIM, JIN YONG

JEONG, SEONG YUN

COUNTRY

KR

KR

## ASSIGNEE-INFORMATION:

NAME

LG ELECTRONICS INC

COUNTRY

KR

APPL-NO: US77545396

APPL-DATE: December 30, 1996

PRIORITY-DATA: KR09568685A (December 30, 1995)

INT-CL (IPC): G11B 7/00

EUR-CL (EPC): G11B007/125; G11B007/135, G11B007/135

## ABSTRACT:

An improved optical pickup apparatus for different discs which is capable of writing and reading a data onto discs having different writing densities and thicknesses by using one optical pickup apparatus and a liquid crystal deflector (LCD) or a Grating Polarizing Beam Splitter (GPBS). The apparatus includes an objective lens for focusing a beam onto optical discs each having different thicknesses, and a numerical aperture control means for selectively passing through a beam in accordance with the thickness of the optical discs, diffracting a portion of the beam, and controlling the numerical aperture of the objective lens.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	RWMD	Draw Desc	Clip Img	Image
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☐ 2. Document ID: EP 773538 A2

L1: Entry 2 of 4

File: EPAB

May 14, 1997

PUB-NO: EP000773538A2  
DOCUMENT-IDENTIFIER: EP 773538 A2  
TITLE: Objective lens driving apparatus

PUBN-DATE: May 14, 1997

INVENTOR-INFORMATION:

NAME

YOSHIZAWA, TAKASHI

COUNTRY

JP

ASSIGNEE-INFORMATION:

NAME

TOKYO SHIBAURA ELECTRIC CO

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APPL-NO: EP96117968

APPL-DATE: November 8, 1996


PRIORITY-DATA: JP29316695A (November 10, 1995)

INT-CL (IPC): G11B 7/09; G11B 7/135; G11B 19/14

EUR-CL (EPC): G11B007/09; G11B007/125, G11B019/14

ABSTRACT:

A lens holder (75) is provided with objective lenses (34, 35) of different types. Rotating the lens holder (75) causes one of the objective lenses (34, 35) to be placed in the optical path of the laser beam. Near one objective lens (35), there is provided a reflecting element (92) that reflects part of the laser beam directed to the objective lens (35). When the objective lens (35) is put in the optical path, the beam from the reflecting element (92) is sensed by a sensor. From the sensing result, it is judged that a specific type of objective lens (35) is in the optical path. Accordingly, there is provided an objective lens driving apparatus that includes at least two objective lenses with different numerical apertures according to optical information recording mediums complying with different standards, is capable of switching between the objective lenses according to the optical information recording medium to be used, and further has a simple structure capable of identifying the type of the objective lens selected

by switching. 

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw. Desc	Image
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☐ 3. Document ID: EP 731458 A1

L1: Entry 3 of 4

File: EPAB

Sep 11, 1996

PUB-NO: EP000731458A1

DOCUMENT-IDENTIFIER: EP 731458 A1

TITLE: Objective lens, optical head device and optical disc reproducing apparatus

PUBN-DATE: September 11, 1996

## INVENTOR-INFORMATION:

NAME

COUNTRY

YAMAKAWA, AKIO

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UEMURA, KAMON

JP

## ASSIGNEE-INFORMATION:

NAME

COUNTRY

SONY CORP

JP

APPL-NO: EP96400494

APPL-DATE: March 8, 1996


PRIORITY-DATA: JP05131195A (March 10, 1995)

INT-CL (IPC): G11B 7/135

EUR-CL (EPC): G11B007/135; G02B003/04

## ABSTRACT:

An objective lens (8) having at least two regions (8a, 8b) of different numerical apertures is configured for focusing a light beam outgoing from a light source (11) as light beams transmitted through the regions of the different numerical apertures whereby to be focused at different distances corresponding to respective signal recording surfaces (1a, 2a) of at least two optical discs (1, 2) having light transmitting layers (1c, 2c) of different thicknesses (t1, t2). Since the objective lens (8) is integrally formed by at least two lens portions (8a, 8b), a light beam outgoing from a common light source (11) is capable of being focused on signal recording surfaces (1a, 2a) of at least two optical discs (1, 2) having the light transmitting layers of different thicknesses. An optical head device (3) employing the objective lens (8) and an optical disc reproducing apparatus employing such optical head device are also disclosed. The objective lens having at least two regions of different numerical apertures of the invention may be a

glass lens or a plastic lens. 

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: EP 731457 A2

L1: Entry 4 of 4

File: EPAB

Sep 11, 1996

PUB-NO: EP000731457A2

DOCUMENT-IDENTIFIER: EP 731457 A2

TITLE: Optical pick-up apparatus capable of reading data irrespective of disc type

PUBN-DATE: September 11, 1996

## INVENTOR-INFORMATION:

NAME

COUNTRY

KIM, JIN-YONG

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KIM, DAE-YOUNG

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LEE, MAN-HYUNG

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PARK, SONG-CHAN

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## ASSIGNEE-INFORMATION:

NAME

COUNTRY

LG ELECTRONICS INC

KR

APPL-NO: EP95402740

APPL-DATE: December 5, 1995

PRIORITY-DATA: KR09544010A (March 4, 1995)

INT-CL (IPC): G11B 7/125; G11B 7/12; G11B 7/09

EUR-CL (EPC): G11B007/00; G11B007/12, G11B007/125 , G11B007/135

## ABSTRACT:

An improved optical pick-up apparatus capable of reading data irrespective of disc type capable of reading various kinds of discs having different thicknesses and writing densities using only one pick-up apparatus, which includes a light source; a beam splitter for passing through or splitting a beam from the light source; an objective lens for condensing the beam onto corresponding disc among discs having different thicknesses and different densities; a numerical aperture control unit for controlling an effective numerical aperture of the objective lens so as to execute a focussing operation with respect to a certain disc; and a photo-detector for receiving the beam reflected by the disc and transmitted from the beam

splitter. 

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	RWIC	Drawn Desc	Image
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(different adj5 numerical adj apertures) same (objective adj lens)	4

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	(objective adj lens)	▼
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JPAB	(different adj5 numerical adj apertures) same (objective adj lens)	8	<u>L2</u>
EPAB	(different adj5 numerical adj apertures) same (objective adj lens)	4	<u>L1</u>